CHLOROPICRIN

Military Designation: PS

Description: At ambient temperature and pressure, chloropicrin has a colorless, oily liquid form with an extremely sharp, sweet, irritating odor. Chloropicrin is a hazard by vapor inhalation or by skin or eye contact with either vapor or liquid.

Non-military uses

An extensively used industrial chemical, chloropicrin was used as a choking agent in World War I. Stenhouse first synthesized it in 1848 by reacting picric acid with chloride of lime. Also known as trichloronitromethane or nitrochloroform, chloropicrin was used extensively as a fumigant for cereals and grains and as a fungicide. Its commercial uses include a soil insecticide to kill weeds and grass seed in soils. The chemical manufacturing process reportedly uses chloropicrin for methyl violet.

Military uses

World War I saw stockpiles of chloropicrin, generally in combination with other chemicals such as stannic chloride or phosgene. Although no longer maintained in the U.S. stockpile of chemical weapons, chloropicrin once filled Livens projectiles, Stokes mortar rounds and artillery projectiles. These older weapons may remain buried at abandoned waste sites around the United States. Also buried or abandoned were chemical agent identification sets, which may contain small ampoules of chloropicrin and chloroform in a 50:50 mixture. The Russian Federation still uses chloropicrin as a qualitative fit-testing substance for air-purifying respirators.

Health effects

As a powerful irritant, chloropicrin can cause immediate, severe inflammation of the eyes, nose and throat, as well as significant upper and lower respiratory tract injuries following acute exposure. Burning of the nose and throat, coughing, shortness of breath, dizziness, nausea or vomiting, headache and extreme eye irritation all rapidly follow high-level exposures to chloropicrin vapor. Following low-level exposures, symptoms usually subside within 15 minutes upon removal from exposure. Ocular symptoms may persist longer if the eyes are rubbed. Skin contact with chloropicrin vapor or liquid results in immediate burning or stinging pain followed by redness. Chloropicrin exposures may also cause nausea and vomiting. Human exposure data for other types of choking agents suggest that acute lung damage from chloropicrin exposure could result in the development of chronic bronchitis, asthma and emphysema, particularly if respiratory tract infections complicate recovery. No animal or human epidemiologic data exists to suggest that chronic chloropicrin causes cancer in those exposed or developmental effects in the unborn fetus.

Environmental fate

Chloropicrin is practically insoluble in water but is miscible in non-polar solvents such as benzene, carbon tetrachloride and chloroform. It will persist in groundwater or soil for moderate periods of time. However, because of chloropicrin's volatility and slow breakdown in water, it will not likely persist for many years in the environment.

REV: 05062016

U.S. ARMY CHEMICAL MATERIALS ACTIVITY | RECOVERED CHEMICAL MATERIEL DIRECTORATE
E4585 HOADLEY ROAD | ABERDEEN PROVING GROUND, MARYLAND 21010
PHONE: 410-436-4292 | WWW.CMA.ARMY.MIL